

M20 Connectors Specification

- ❖ 2.54mm pitch, with 0.64mm square male pin connection system.
- ❖ Board-to-Board and Cable-to-Board application options.

❖ Materials

Mouldings:	Standard or High Temperature Plastic, UL94V-0
Contacts	
Female:	Phosphor Bronze
Male:	Copper Alloy
Finish:	See individual pages

❖ Electrical

Current:	3A per contact
Voltage proof:	800V AC, 500V DC for 1 minute
Contact resistance:	30mΩ max
Insulation resistance:	1,000MΩ min

❖ Mechanical

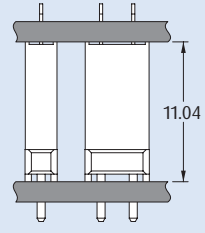
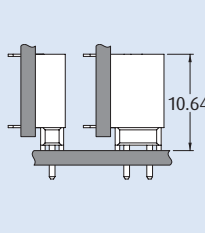
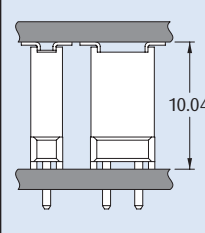
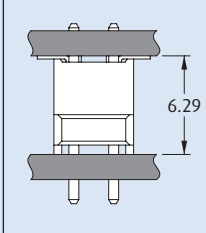
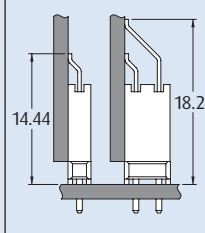
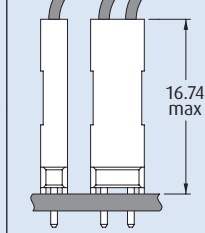
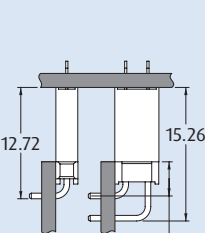
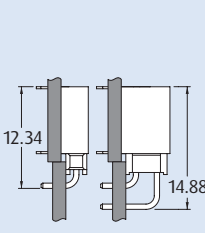
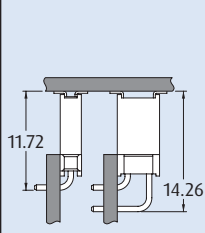
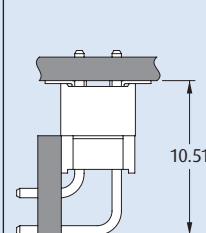
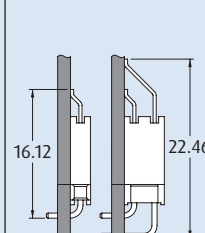
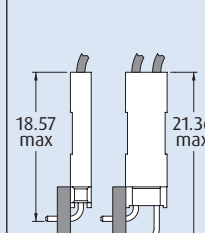
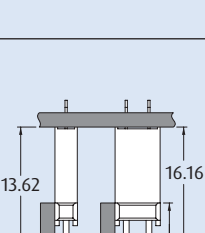
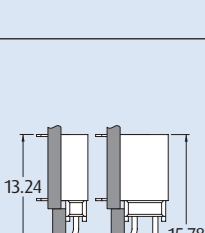
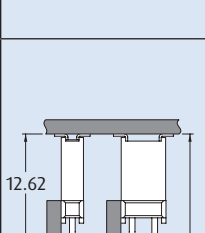
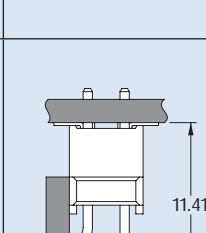
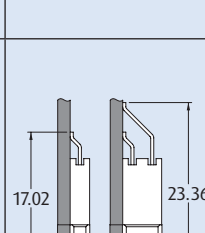
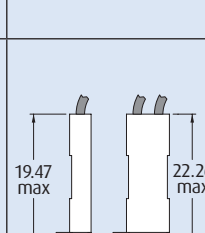
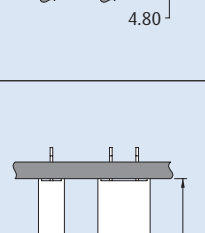
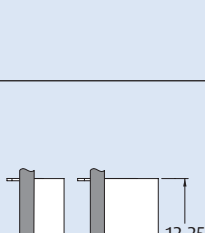
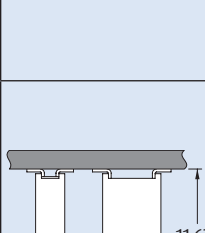
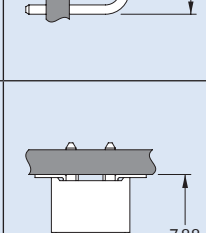
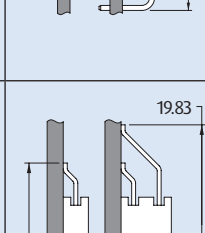
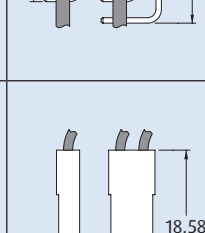
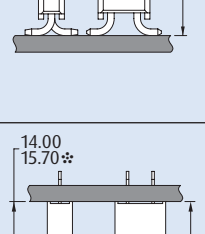
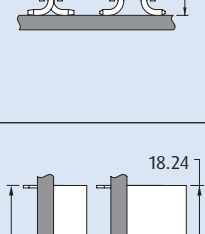
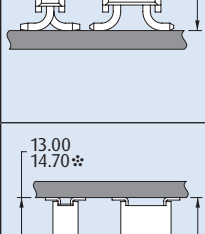
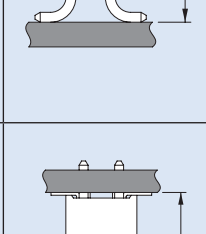
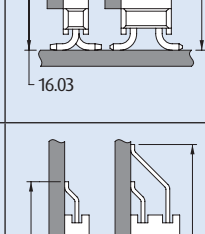
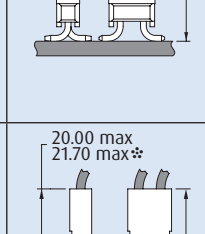
Durability	
Gold finish:	300 operations
Tin finish:	50 operations
Insertion force (max)	
Female:	2.0N per contact
Jumper sockets:	12.5N total
Withdrawal force (min)	
Female:	0.3N per contact
Jumper sockets:	1.0N total
Vibration sensitivity:	50 – 2,000Hz, 3.13G, 45 minutes duration
Shock severity:	294m/s ² (30G) for 11ms

❖ Environmental

Operating temperature:	-40°C to +105°C
Solderability:	245°C for 5 seconds
Soldering heat resistance:	260°C for 10 seconds

M20 Connectors Mating Profiles

2.54mm (.100") PITCH

		FEMALE					
		VERTICAL PC TAIL	HORIZONTAL PC TAIL	VERTICAL SMT	VERTICAL SMT Low Profile	HORIZONTAL SMT	CRIMP
MALE	VERTICAL PC TAIL	 11.04	 10.64	 10.04	 6.29	 14.44 / 18.24	 16.74 max
	HORIZONTAL PC TAIL 3.9mm Tail	 12.72 / 15.26 / 3.90	 12.34 / 14.88	 11.72 / 14.26	 10.51	 16.12 / 22.46	 18.57 max / 21.36 max
	HORIZONTAL PC TAIL 4.8mm Tail	 13.62 / 16.16 / 4.80	 13.24 / 15.78	 12.62 / 15.16	 11.41	 17.02 / 23.36	 19.47 max / 22.26 max
	VERTICAL SMT	 12.63	 12.25	 11.63	 7.88	 16.03 / 19.83	 18.58 max
	HORIZONTAL SMT *High Profile Single Row	 14.00 / 15.70** / 18.62	 13.62 / 15.32** / 18.24	 13.00 / 14.70** / 17.62	 13.87	 17.40 / 19.10** / 25.82	 20.00 max / 21.70 max** / 24.62 max

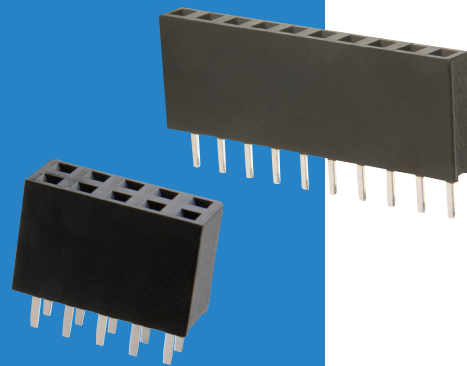
All dimensions in mm.

M20 Connectors

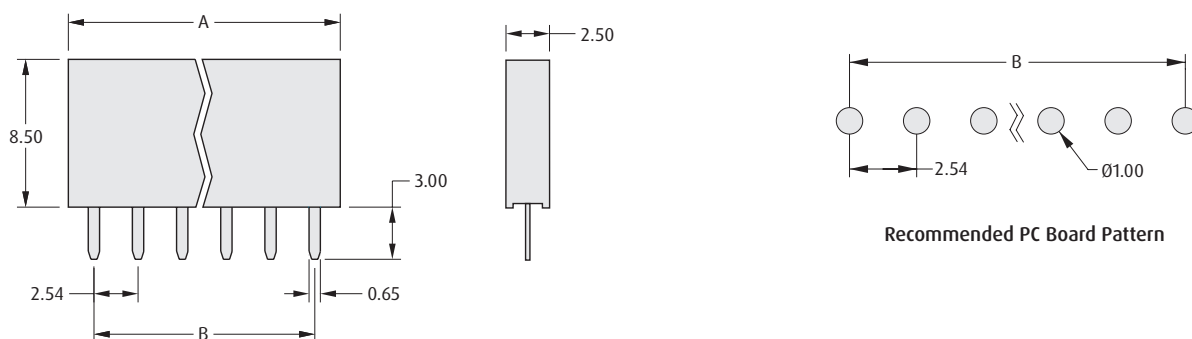
2.54mm (.100") PITCH

Female Vertical PC Tail

- Twin beam phosphor bronze contacts.
- Suitable for use with mating M20 male pin headers, with 0.64mm square pins.



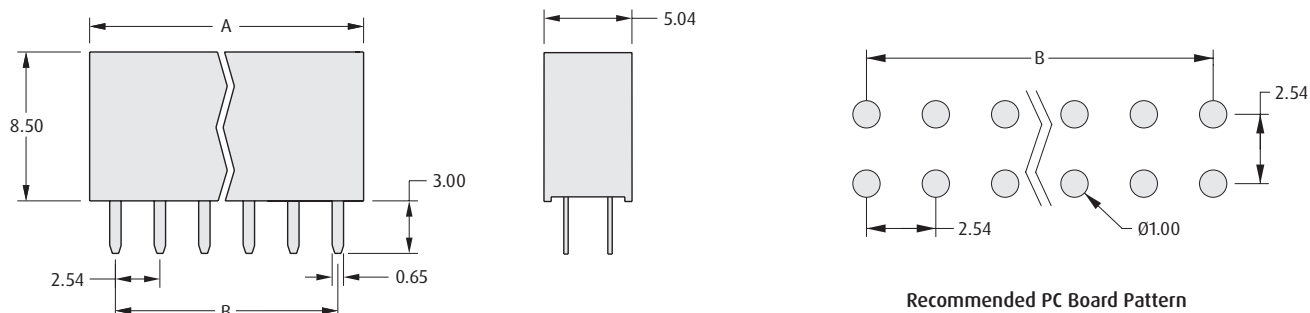
SINGLE ROW



CALCULATION

A	$B + 2.94$
B	$2.54 \times (\text{No. of contacts per row} - 1)$

DOUBLE ROW



HOW TO ORDER

M20 - 78 X XX XX

SERIES CODE

TYPE

2	Single Row
3	Double Row

FINISH

42	Gold + Tin
46	Tin

NO. OF CONTACTS PER ROW

02 to 20, 25, 32, 36

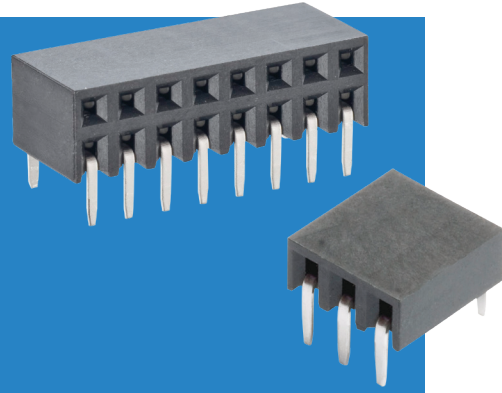
All dimensions in mm.

M20 Connectors

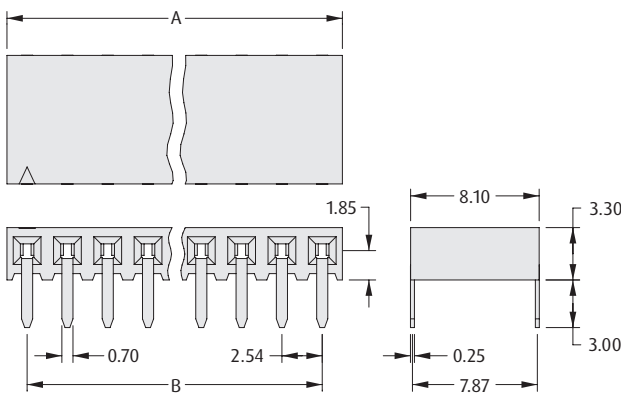
2.54mm (.100") PITCH

Female Horizontal PC Tail

- Two point solder fixing for connector rigidity.
- Twin beam contact for cost-effective reliability.
- Suitable for use with mating M20 male pin headers, with 0.64mm square pins.

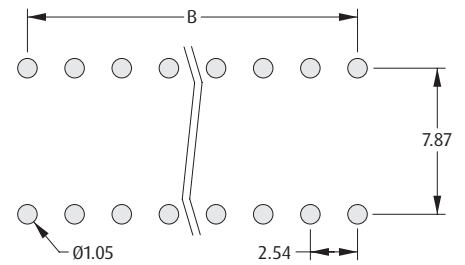


SINGLE ROW



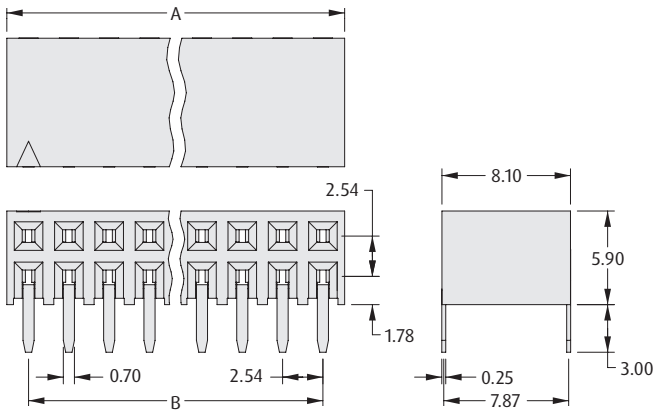
CALCULATION

A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)



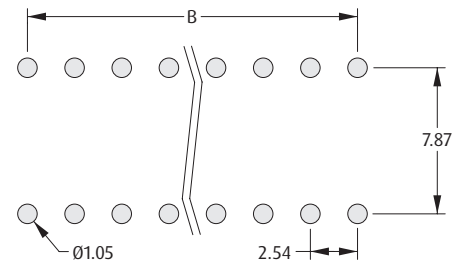
Recommended PC Board Pattern

DOUBLE ROW



CALCULATION

A	B + 2.74
B	2.54 x (No. of contacts per row - 1)



Recommended PC Board Pattern

HOW TO ORDER

M20 - 78 X XX XX

SERIES CODE

TYPE

8	Double Row
9	Single Row

FINISH

42	Gold + Tin
46	Tin

NO. OF CONTACTS PER ROW

02 to 20, 25, 35, 36	Double Row
02 to 20, 25, 36, 40	Single Row

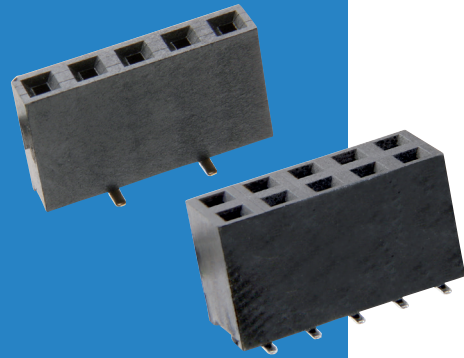
All dimensions in mm.

M20 Connectors

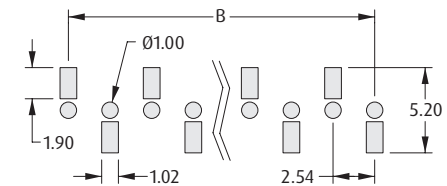
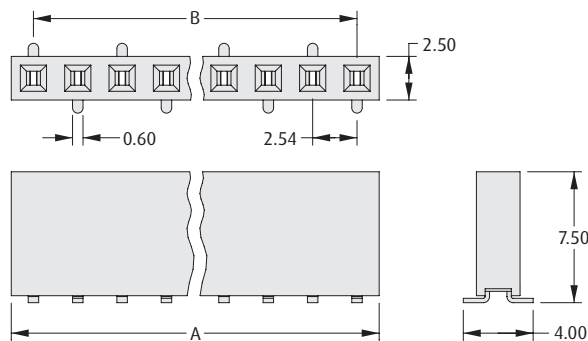
2.54mm (.100") PITCH

Female Vertical Surface Mount, Dual Entry

- ❏ Dual Entry sockets - can be used as either a top entry or bottom entry configuration.
- ❏ Twin beam contact for cost-effective reliability.
- ❏ Contact technical@harwin.com for Tape and Reel options.
- ❏ Suitable for use with mating M20 male pin headers, with 0.64mm square pins.



SINGLE ROW

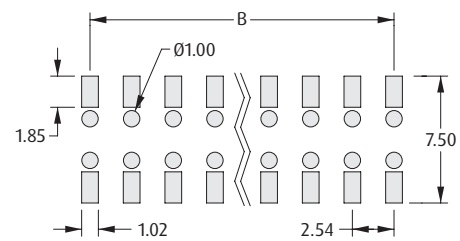
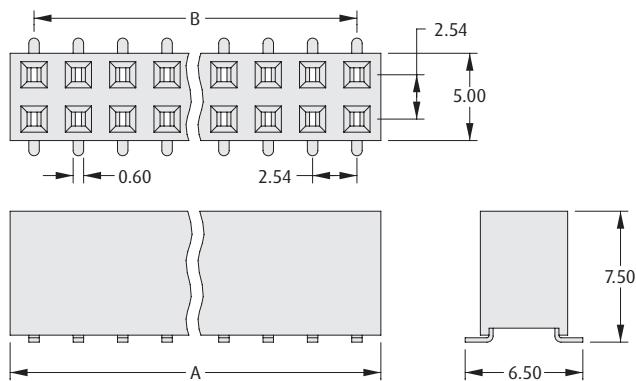


Recommended PC Board Pattern

CALCULATION

A	$B + 2.74$
B	$2.54 \times (\text{No. of contacts per row} - 1)$

DOUBLE ROW



Recommended PC Board Pattern

HOW TO ORDER

M20 - 78 X XX XX

SERIES CODE

TYPE

6	Single Row
7	Double Row

FINISH

42	Gold + Tin
46	Tin

NO. OF CONTACTS PER ROW

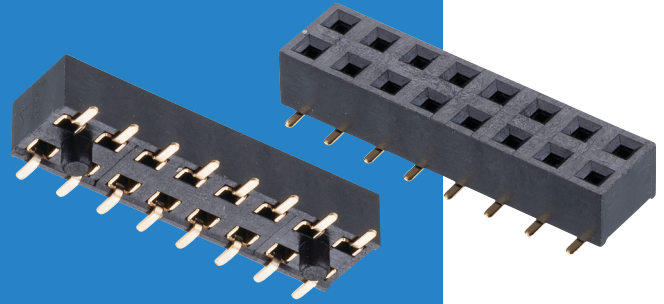
02 to 20

All dimensions in mm.

M20 Connectors

Female Vertical Surface Mount, Dual Entry

- ❏ Dual Entry socket - can be used as either a top entry or bottom entry configuration.
- ❏ Twin beam contact for cost-effective reliability.
- ❏ Tape and Reel option supplied fitted with Pick and Place cap.
- ❏ Suitable for use with mating M20 male pin headers, with 0.64mm square pins.

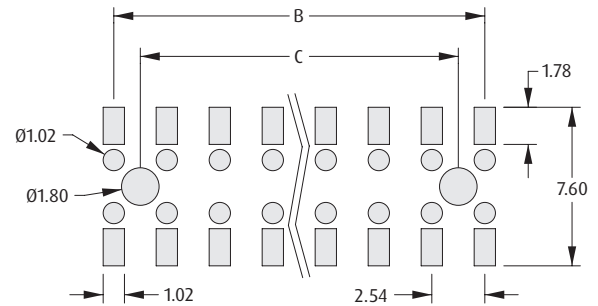
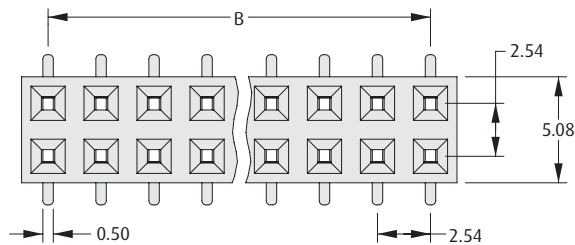


2.54mm (.100") PITCH

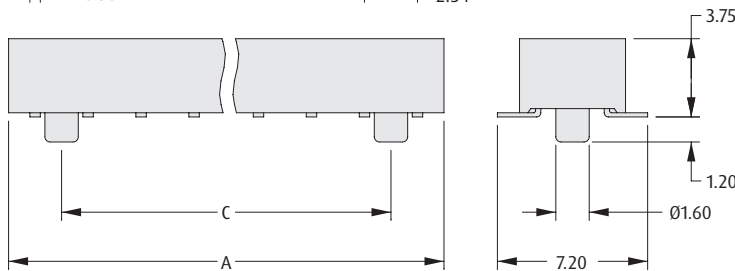
DOUBLE ROW

CALCULATION

A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)
C	B - 2.54



Recommended PC Board Pattern



HOW TO ORDER

M20 - 781 XX 45 X

SERIES CODE

NO. OF CONTACTS PER ROW

02 to 10, 12, 15, 20

PACKAGING

Blank	Loose
R	Tape & Reeled

FINISH

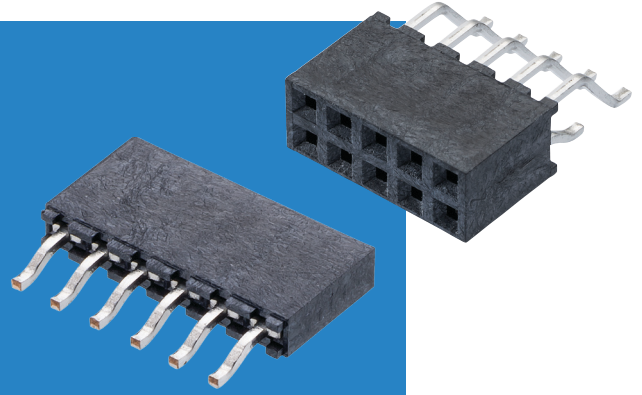
45	Gold
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All dimensions in mm.

M20 Connectors

Female Horizontal Surface Mount

- Rear tail configuration, to allow mounting right up to the edge of the PCB.
- Supplied in Tape and Reel packaging as standard for use in automated assembly systems.



2.54mm (.100") PITCH

SINGLE ROW	DOUBLE ROW						
<table border="1" style="background-color: #0056b3; color: white;"> <thead> <tr> <th colspan="2">CALCULATION</th> </tr> </thead> <tbody> <tr> <td style="background-color: #0056b3; color: white;">A</td> <td>$B + 2.79$</td> </tr> <tr> <td style="background-color: #0056b3; color: white;">B</td> <td>$2.54 \times (\text{No. of contacts per row} - 1)$</td> </tr> </tbody> </table>		CALCULATION		A	$B + 2.79$	B	$2.54 \times (\text{No. of contacts per row} - 1)$
CALCULATION							
A	$B + 2.79$						
B	$2.54 \times (\text{No. of contacts per row} - 1)$						
Recommended PC Board Pattern	Recommended PC Board Pattern						

HOW TO ORDER

M20 - 79 X XX 42 R

SERIES CODE

NO. OF ROWS

1	Single Row
2	Double Row

PACKAGING

R Tape & Reeled

FINISH

42 Gold + Tin

NO. OF CONTACTS PER ROW

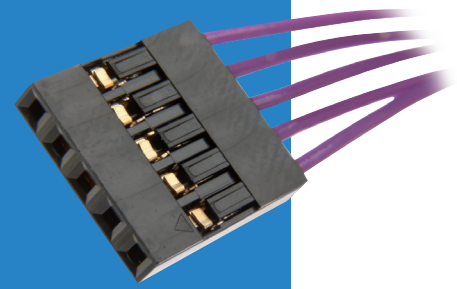
02 to 06, 08, 10

All dimensions in mm.

M20 Connectors

Female Crimp Housings

- Female crimp housing - contacts are ordered separately (shown on following page).
- For polarising key use **order code M20-003**



2.54mm (.100") PITCH

SINGLE ROW	CALCULATION	DOUBLE ROW	CALCULATION								
	<table border="1"> <tr> <td style="background-color: #0070C0; color: white; font-weight: bold;">A</td> <td>$B + 2.74$</td> </tr> <tr> <td style="background-color: #0070C0; color: white; font-weight: bold;">B</td> <td>$2.54 \times (\text{No. of contacts per row} - 1)$</td> </tr> </table>	A	$B + 2.74$	B	$2.54 \times (\text{No. of contacts per row} - 1)$		<table border="1"> <tr> <td style="background-color: #0070C0; color: white; font-weight: bold;">A</td> <td>$2.54 \times \text{No. of contacts per row}$</td> </tr> <tr> <td style="background-color: #0070C0; color: white; font-weight: bold;">B</td> <td>$2.54 \times (\text{No. of contacts per row} - 1)$</td> </tr> </table>	A	$2.54 \times \text{No. of contacts per row}$	B	$2.54 \times (\text{No. of contacts per row} - 1)$
A	$B + 2.74$										
B	$2.54 \times (\text{No. of contacts per row} - 1)$										
A	$2.54 \times \text{No. of contacts per row}$										
B	$2.54 \times (\text{No. of contacts per row} - 1)$										

HOW TO ORDER

M20 - 10 X XX 00

SERIES CODE

TYPE

6	Single Row
7	Double Row

NO. OF CONTACTS PER ROW

02 to 12

All dimensions in mm.

M20 Connectors

Female Crimp Contacts, Polarising Key

- ❖ Loose or reeled contacts.
- ❖ Open crimp design, ideal for automation.
- ❖ Use with female crimp housings shown on previous page.

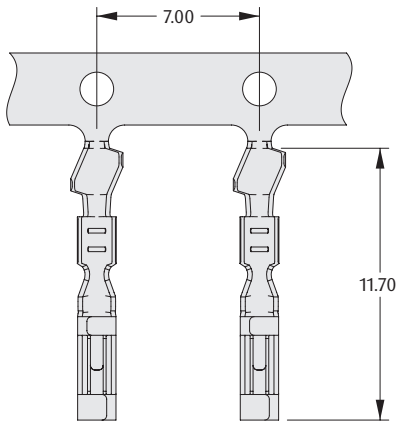


2.54mm (.100") PITCH

CONTACTS

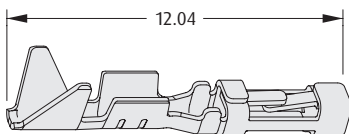
Reeled (continuous strip)

- ❖ Order code is for one reel of 10,000 contacts.



Loose (cropped)

- ❖ Order code is for one pack of 100 contacts.



HAND CRIMP TOOL

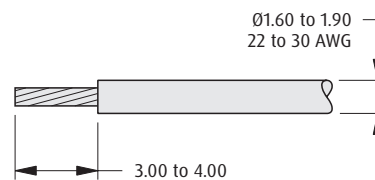
- ❖ Instruction sheet is available at www.harwin.com/instructions.
- ❖ For use with loose contacts.



ORDER CODE

Z20-320

WIRE STRIPPING DETAILS



HOW TO ORDER

M20 - 11 X 00 XX

SERIES CODE

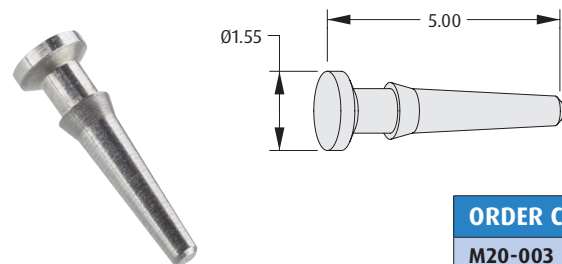
TYPE

6	Reeled Contacts
8	Loose Contacts

FINISH

42	Gold + Tin
46	Tin

POLARISING KEY



ORDER CODE

M20-003

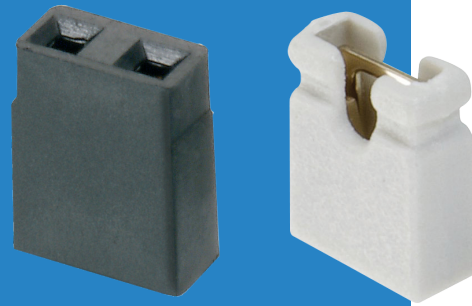
All dimensions in mm.

M20 Connectors

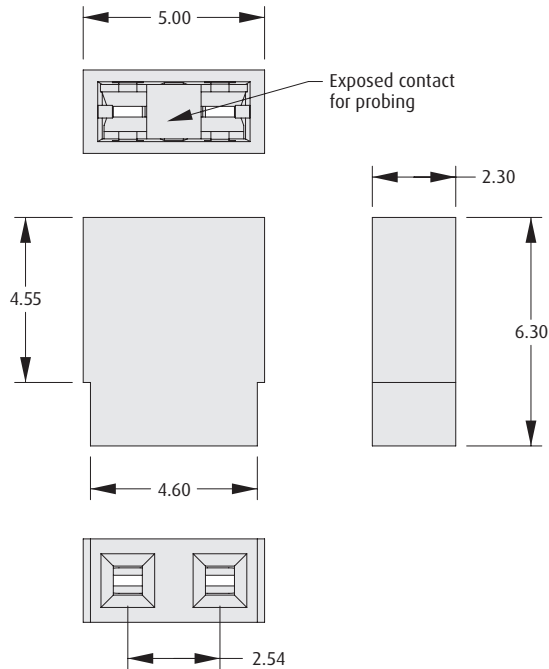
2.54mm (.100") PITCH

Jumper Sockets - Open Top

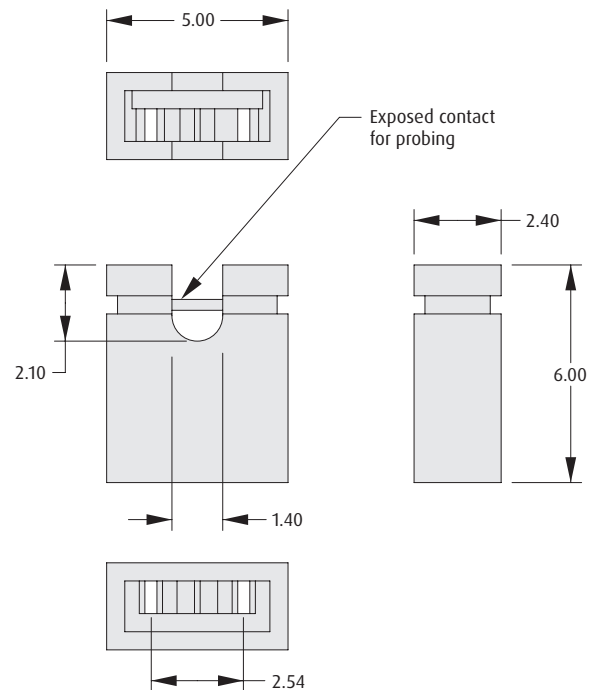
- ❖ Can be fitted by hand, giving an alternative on-board programming method to DIP switches.
- ❖ Open top for use with test probes.
- ❖ Choice of colours available.
- ❖ Multi-use socket provides up to 300 operations (Gold).
- ❖ Twin beam contact for cost-effective reliability.
- ❖ Suitable for use with mating M20 male pin headers, with 0.64mm square pins.



MULTI-USE



HIGH FORCE, SINGLE OPERATION



HOW TO ORDER

M75 XX - XX

SERIES CODE

MULTI-USE	SINGLE OPERATION	
65		Grey
66	81	Red
67	82	Black
71	83	Blue

FINISH

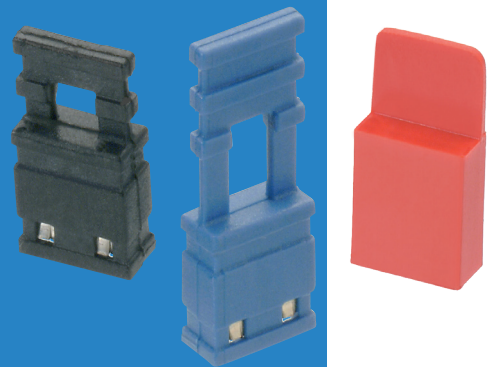
05	Gold
46	Tin

All dimensions in mm.

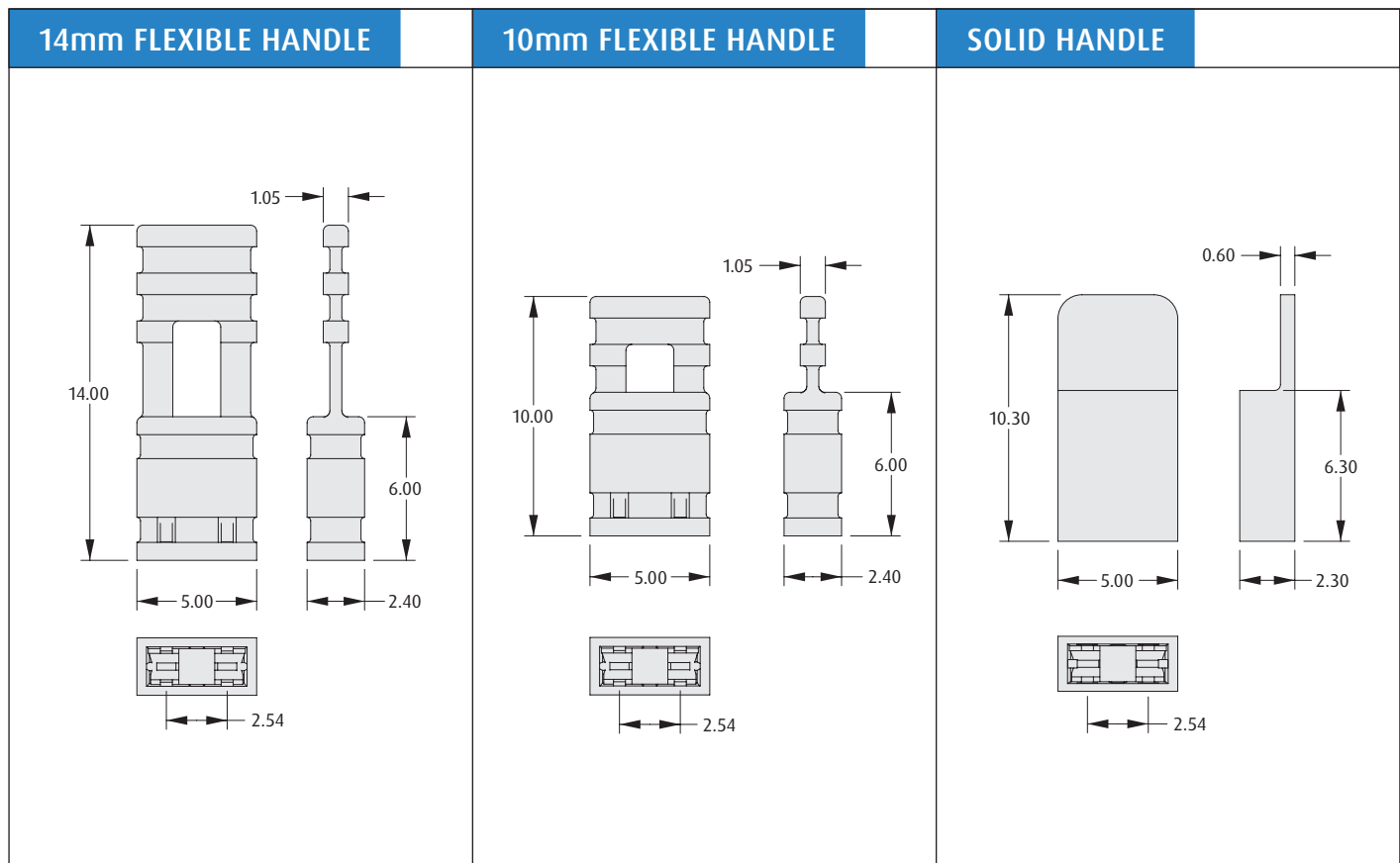
M20 Connectors

Jumper Sockets - Closed Top

- Can be fitted by hand, giving an alternative on-board programming method to DIP switches.
- Twin beam contact for cost-effective reliability.
- Suitable for use with mating M20 male pin headers, with 0.64mm square pins.
- Choice of colours available.
- Flexible handle for ease of location and withdrawal.



2.54mm (.100") PITCH



HOW TO ORDER

M7 XXX - XX

SERIES CODE

14mm HANDLE	10mm HANDLE	SOLID HANDLE	
680	684	965	Grey
681	685	966	Red
682	686	967	Black
683	687		Blue

FINISH

05	Gold
46	Tin

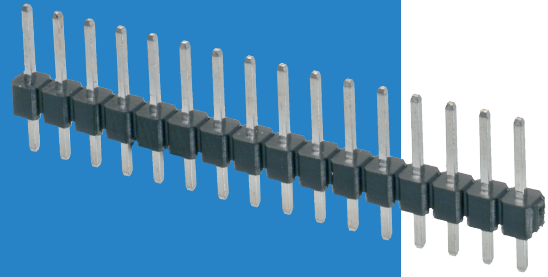
All dimensions in mm.

M20 Connectors

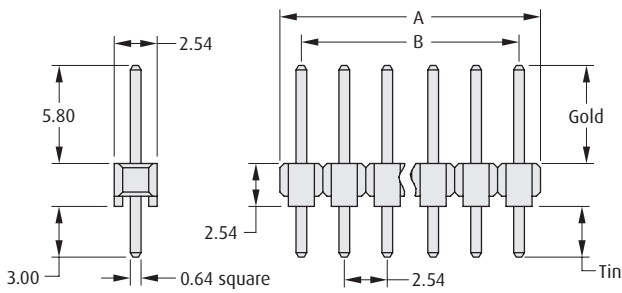
2.54mm (.100") PITCH

Male Vertical Single Row PC Tail

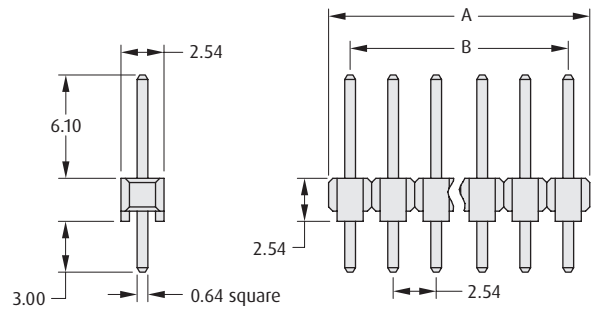
- ❖ Suitable for use with female connectors and jumper sockets shown on previous pages.
- ❖ Choice of mating pin lengths.
- ❖ Pin headers can be cut into smaller sizes.
- ❖ Also available with variable dimensions.



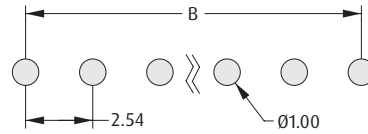
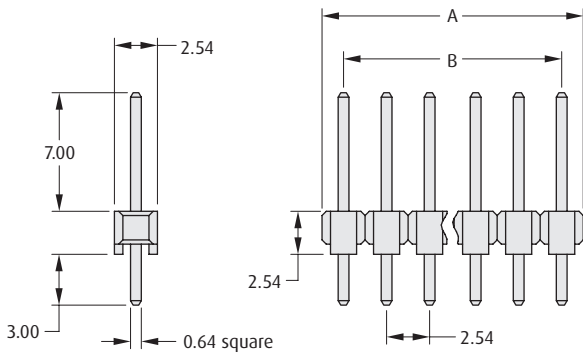
5.8mm



6.1mm



7.0mm



Recommended PC Board Pattern

CALCULATION

A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)

HOW TO ORDER

M20 - 9 XX XX XX

SERIES CODE

TYPE

73	7.0mm Mating Height
77	5.8mm Mating Height
99	6.1mm Mating Height

FINISH

42	Gold + Tin (M20-977)
45	Gold (M20-973, 999)
46	Tin

NO. OF CONTACTS PER ROW

02 to 20, 25 to 28, 36, 40	7.0mm Mating Height
02 to 20, 25, 26, 32, 36, 40	5.8mm Mating Height
02 to 20, 23, 25, 30 to 33, 36, 40	6.1mm Mating Height

All dimensions in mm.

M20 Connectors

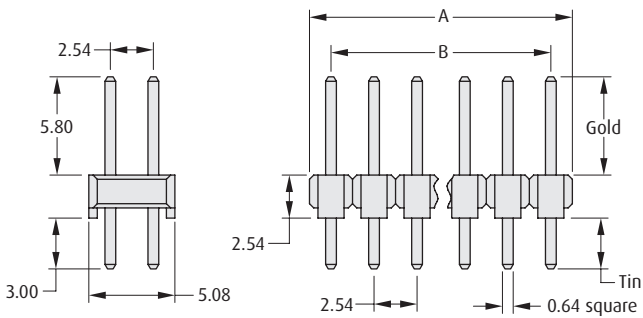
Male Vertical Double Row PC Tail

- Suitable for use with female connectors and jumper sockets shown on previous pages.
- Choice of mating pin lengths.
- Pin headers can be cut into smaller sizes.
- Also available with variable dimensions.

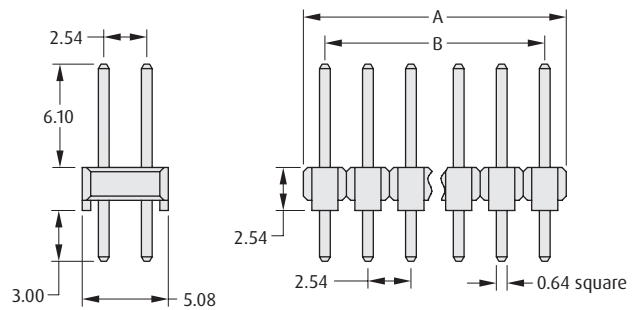


2.54mm (.100") PITCH

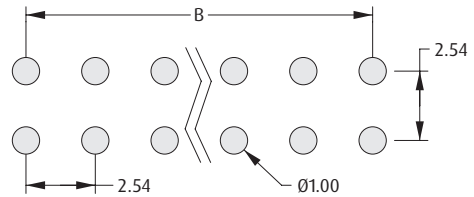
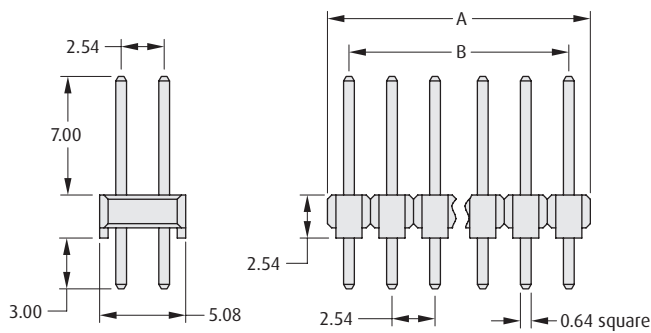
5.8mm



6.1mm



7.0mm



Recommended PC Board Pattern

CALCULATION

A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)

HOW TO ORDER

M20 - 9 XX XX XX

SERIES CODE

TYPE

72	7.0mm Mating Height
76	5.8mm Mating Height
98	6.1mm Mating Height

FINISH

42	Gold + Tin (M20-976)
45	Gold (M20-972, 998)
46	Tin

NO. OF CONTACTS PER ROW

02 to 20, 24, 25, 36, 40	7.0mm Mating Height
02 to 20, 25, 36, 40	5.8mm Mating Height
02 to 20, 23 to 25, 32, 36, 40	6.1mm Mating Height

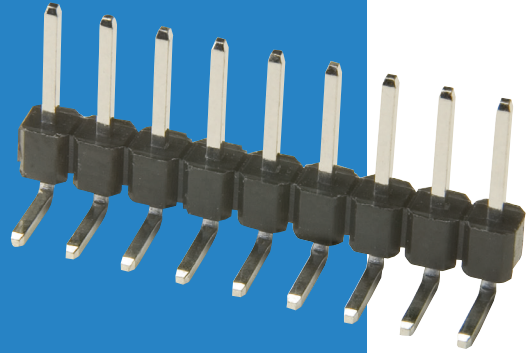
All dimensions in mm.

M20 Connectors

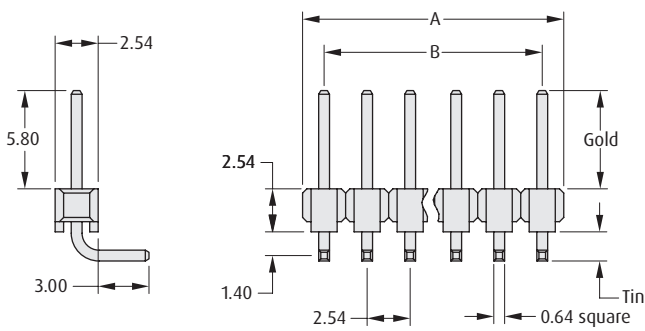
2.54mm (.100") PITCH

Male Horizontal Single Row PC Tail

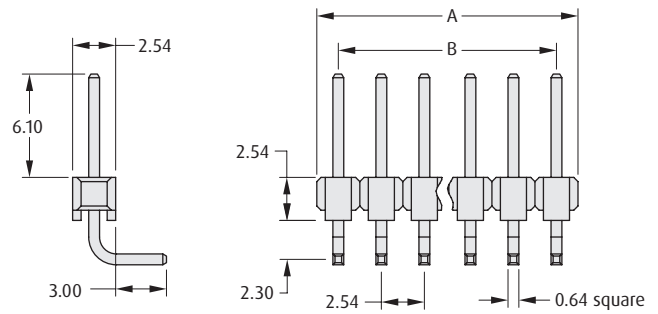
- ❖ Horizontal orientation for 90° board-to-board applications.
- ❖ Suitable for use with female connectors and jumper sockets shown on previous pages.
- ❖ Choice of mating pin lengths.
- ❖ Pin headers can be cut into smaller sizes.
- ❖ Also available with variable dimensions.



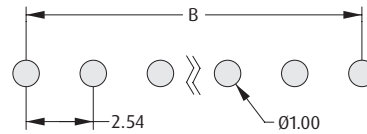
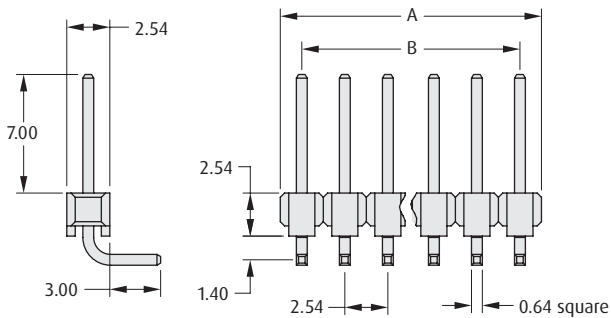
5.8mm



6.1mm



7.0mm



Recommended PC Board Pattern

CALCULATION

A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)

HOW TO ORDER

M20 - 9 XX XX XX

SERIES CODE

TYPE

71	7.0mm Mating Height
75	5.8mm Mating Height
96	6.1mm Mating Height

FINISH

42	Gold + Tin (M20-975)
45	Gold (M20-971, 996)
46	Tin

NO. OF CONTACTS PER ROW

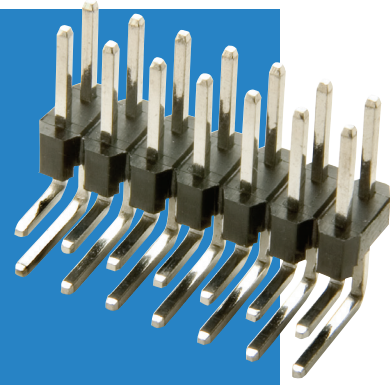
02 to 20, 22, 23, 26, 36, 40	7.0mm Mating Height
02 to 20, 25, 36, 40	5.8mm Mating Height
02 to 20, 24, 25, 36, 40	6.1mm Mating Height

All dimensions in mm.

M20 Connectors

Male Horizontal Double Row PC Tail

- Horizontal orientation for 90° board-to-board applications.
- Suitable for use with female connectors and jumper sockets shown on previous pages.
- Choice of mating pin lengths.
- Pin headers can be cut into smaller sizes.
- Also available with variable dimensions.



2.54mm (.100") PITCH

5.8mm	6.1mm
	<p style="text-align: center;">Recommended PC Board Pattern</p>

CALCULATION	
A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)

HOW TO ORDER

M20 - 9 XX XX XX

SERIES CODE

TYPE

70	7.0mm Mating Height
74	5.8mm Mating Height
95	6.1mm Mating Height

FINISH

42	Gold + Tin (M20-974)
45	Gold (M20-970, 995)
46	Tin

NO. OF CONTACTS PER ROW

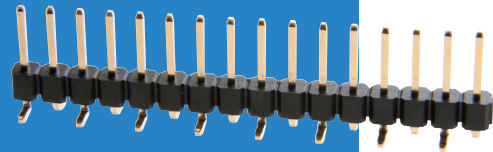
02 to 20, 22, 25, 27, 36, 40	7.0mm Mating Height
02 to 20, 25, 36, 40	5.8mm Mating Height
02 to 20, 24, 25, 32, 36, 40	6.1mm Mating Height

All dimensions in mm.

M20 Connectors

Male Vertical Surface Mount Single Row

- Pin headers can be cut into smaller sizes.
- Also available with variable dimensions.
- Tape and Reel option supplied fitted with Pick and Place cap, contact technical@harwin.com for availability.
- Suitable for use with female connectors and jumper sockets shown on previous pages.

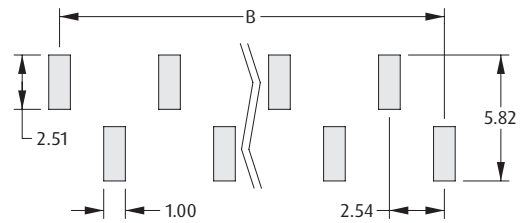
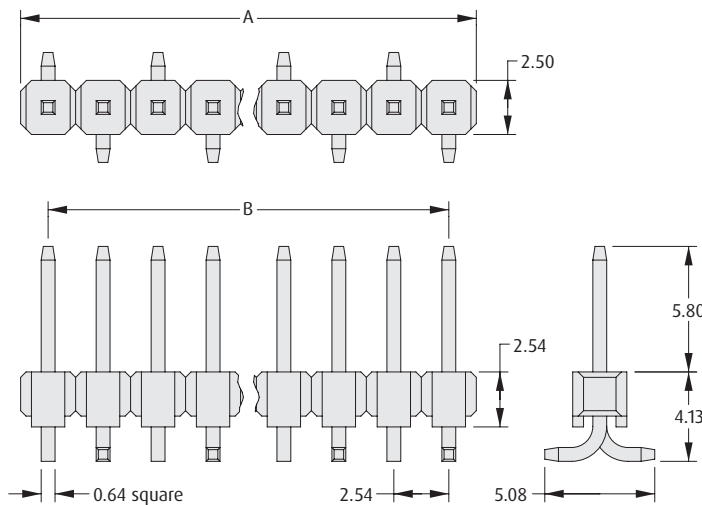


2.54mm (.100") PITCH

SINGLE ROW

CALCULATION

A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)



Recommended PC Board Pattern

HOW TO ORDER

M20 - 877 XX XX X

SERIES CODE

NO. OF CONTACTS PER ROW

02 to 20, 25, 36	Loose
02 to 20	Pick and Place cap, tube
02, 03, 04, 06, 08, 10, 15, 19	Tape & Reeled

PACKAGING

Blank	Loose
P	Pick and Place cap, tube
R	Tape & Reeled

FINISH

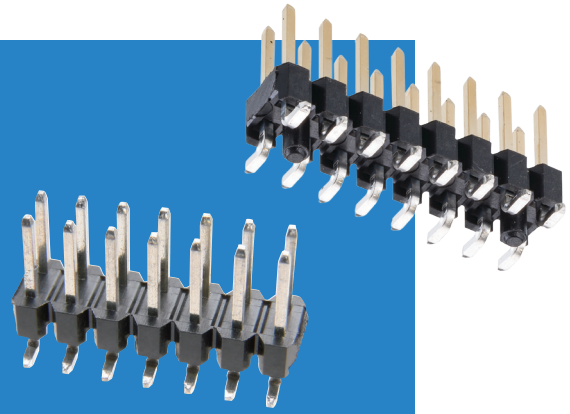
42	Gold + Tin
46	Tin

All dimensions in mm.

M20 Connectors

Male Vertical Surface Mount Double Row

- Pin headers without pegs can be cut into smaller sizes.
- Peg option to assist with location during surface mount process.
- Also available with variable dimensions.
- Tape and Reel option supplied fitted with Pick and Place cap, contact technical@harwin.com for availability.
- Suitable for use with female connectors and jumper sockets shown on previous pages.



2.54mm (.100") PITCH

WITHOUT PEGS	CALCULATION	WITH PEGS	CALCULATION
	A 2.54 x No. of contacts per row		A 2.54 x No. of contacts per row
	B 2.54 x (No. of contacts per row - 1)		B 2.54 x (No. of contacts per row - 1)
			C B - 2.54

Recommended PC Board Pattern

Recommended PC Board Pattern

HOW TO ORDER

M20 - 87 X XX XX X

SERIES CODE

TYPE

6	Without Pegs
5	With Pegs

NO. OF CONTACTS PER ROW

02 to 20, 25, 36	Without Pegs (Loose)
02 to 20, 23	Without Pegs (Tube)
02 to 08, 10	With Pegs (Loose)
02, 03, 05, 07, 08, 10	With Pegs (Reeled)

PACKAGING

Blank	Loose
P	Pick and Place cap, tube (Without Pegs)
R	Tape & Reeled

FINISH

42	Gold + Tin
46	Tin (Without Pegs)

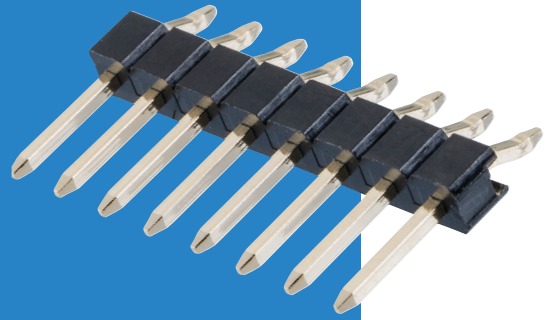
All dimensions in mm.

M20 Connectors

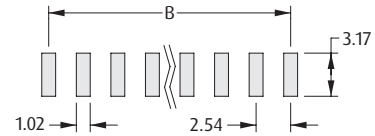
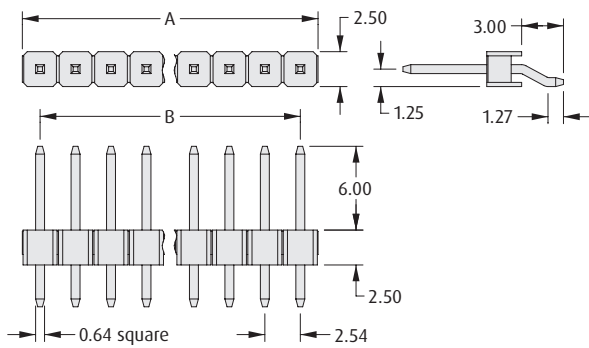
2.54mm (.100") PITCH

Male Horizontal Surface Mount Single Row

- Pin headers can be cut into smaller sizes.
- Contact technical@harwin.com for Tape and Reel options.
- Suitable for use with female connectors and jumper sockets shown on previous pages.
- Horizontal orientation for 90°C board-to-board applications.



STANDARD PROFILE

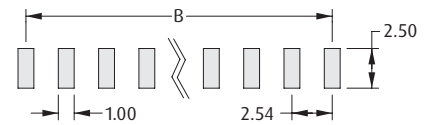
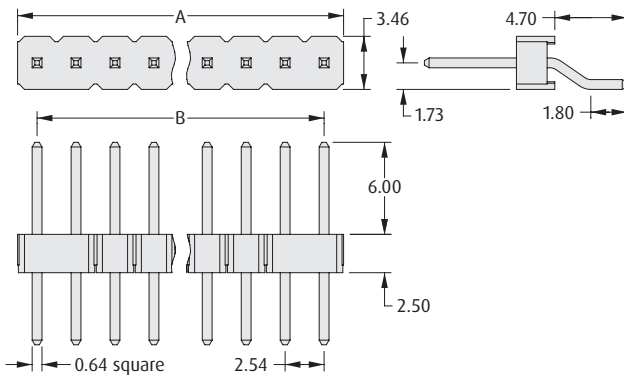


Recommended PC Board Pattern

CALCULATION

A	2.54 x No. of contacts per row
B	2.54 x (No. of contacts per row - 1)

HIGH PROFILE



Recommended PC Board Pattern

HOW TO ORDER

M20 - 8XX XX 05 X

SERIES CODE

TYPE

889	Standard Profile
890	High Profile

NO. OF CONTACTS PER ROW

02 to 06, 08, 10	Standard Profile
03 to 20	High Profile

PACKAGING

Blank	Loose
R	Tape & Reeled (Standard Profile)

FINISH

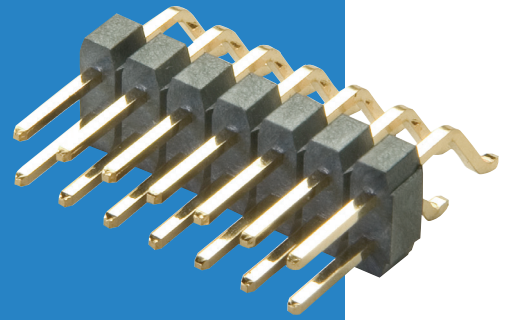
05	Gold (High Profile)
45	Gold (Standard Profile)

All dimensions in mm.

M20 Connectors

Male Horizontal Surface Mount Double Row

- Pin headers can be cut into smaller sizes.
- Contact technical@harwin.com for Tape and Reel options.
- Suitable for use with female connectors and jumper sockets shown on previous pages.
- Horizontal orientation for 90° board-to-board applications.

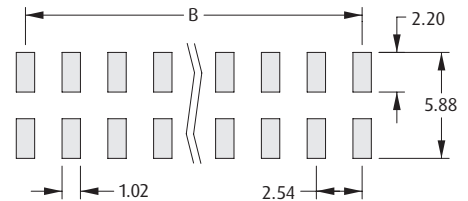
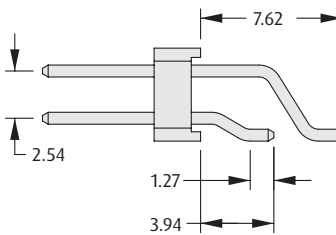
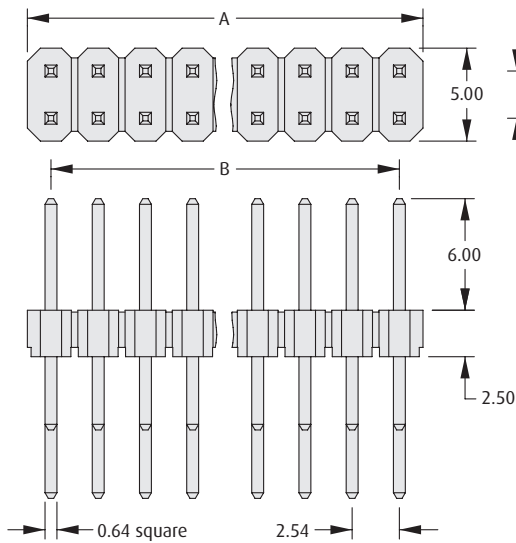


2.54mm (.100") PITCH

DOUBLE ROW

CALCULATION

A	$2.54 \times \text{No. of contacts per row}$
B	$2.54 \times (\text{No. of contacts per row} - 1)$



Recommended PC Board Pattern

HOW TO ORDER

M20 - 891 XX 05

SERIES CODE

FINISH

05 Gold

NO. OF CONTACTS PER ROW

02 to 20

All dimensions in mm.

M20 Connectors

2.54mm (.100") PITCH

Pin Header Variants

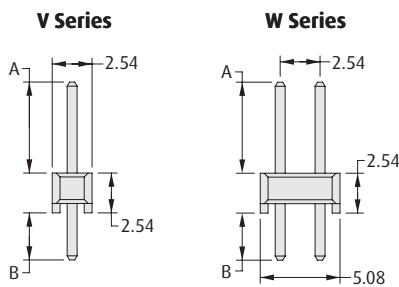
- ❖ If you are unable to specify the connector you require from our standard range of M20 connectors, use the order code below to create an application-specific connector.
- ❖ Contact technical@harwin.com for further information, or search online for M20-XXX.
- ❖ Suitable for use with female connectors shown on previous pages.



TERMINATION STYLES

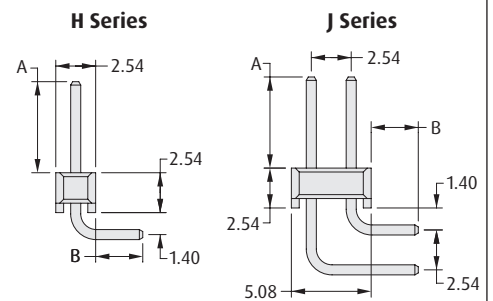
Vertical PC Tail

- ❖ Pin section is 0.64mm square.
- ❖ PCB mounting hole is $\varnothing 1.00\text{mm}$.



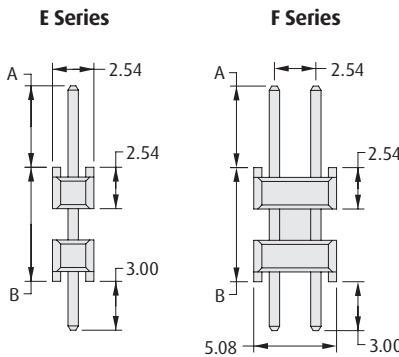
Horizontal PC Tail

- ❖ Pin section is 0.64mm square.
- ❖ PCB mounting hole is $\varnothing 1.00\text{mm}$.
- ❖ Maximum B dimension is 6.00mm.



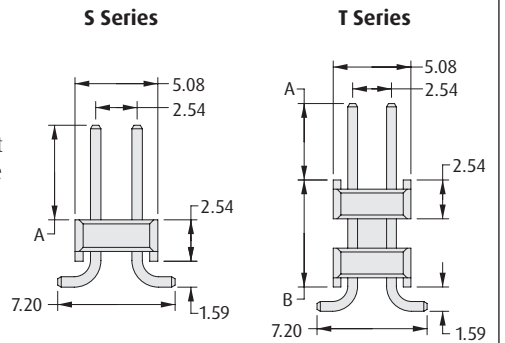
Extended PC Tail

- ❖ Pin section is 0.64mm square.
- ❖ PCB mounting hole is $\varnothing 1.00\text{mm}$.



Vertical SMT Extended SMT

- ❖ Pin section is 0.64mm square.
- ❖ For PCB pad layout see standard Male SMT pin header.
- ❖ B dimension is 000 on S series.



HOW TO ORDER

M20 - XXX XXX X XX XX

SERIES CODE

DIMENSION A

Example: 7.8mm = 078

DIMENSION B

Example: 5.0mm = 050

FINISH

45 Gold

46 Tin

NO. OF CONTACTS PER ROW

02 to 40

SINGLE ROW	DOUBLE ROW	
V	W	Vertical
H	J	Horizontal
E	F	Extended
-	S	Surface Mount
-	T	Extended Surface Mount

All dimensions in mm.